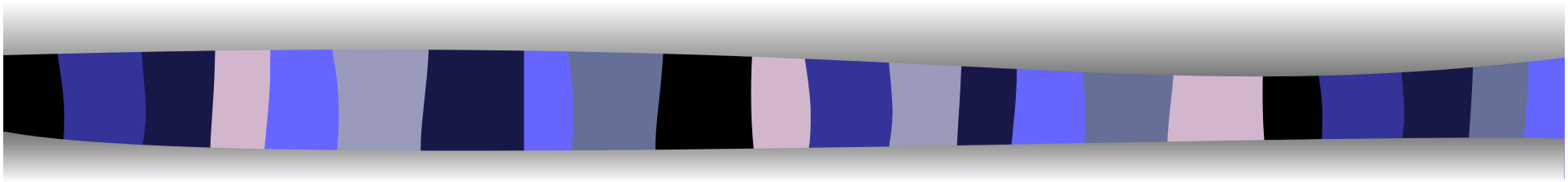
Nutrients and Conventionals



By Media

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Open Lake - Who & What

Focus	Investigator	Analytes
GRLN	GLNPO	Cl-, NH4+, Nitrate, Silica, TKN, tot-P, Ortho-P, diss-P
GPLN	GLNPO	Alkalinity, pH, cond, turbidity, hardness
BALN	Batelle	POC, DOC, TSS

The Verification Process

- GRLN - Some linking problems between lab and field information and between duplicate pairs. Due to sample ID errors
- GPLN - Results for alkalinity reported as conductivity; Some linking problems between lab and field duplicate pairs
- BALN - Problems with accuracy of field information; Sample collection and station visits.

GRLN - Issues

- The sensitivity of the ortho-phosphorus method not low enough; 83% of RFS samples below the MDL (ascorbic acid method)
- The PI used a secret code system to blind the field QC samples to the laboratory. Used for only the first year. The conversion caused sample ID problems
- Miscommunication with lab, no formal RPD limits when samples analyzed

GRLN - Statistics

- System and Analytical Precision > MDL
  - Most of the analytes below 20% RPD with the following exceptions:
    - Ammonia = analytical precision 61%(n=14)
    - Dissolved Phosphorus = analytical precision 25% (n= 43) and system precision 30% (n=46)

BALN - Issues

- Problems with accuracy of times and dates of field sampling
- Problems with the linkage of BALN analytes to other open lake nutrient/conventional focuses due to differences in sampling depths and measurement of total sampling collection time

Sediments - Who & What

Focus	**Investigator**	**Analytes**
GLSN	Johengen	biogenic silica, total phosphorus, available phosphorus
NASN	Eadie	total organic nitrogen and carbon

Sediment Sampling Information

- It appears that some of the visit and sample collection information, dates and time, are incorrect. Some of the cruise logbooks have not been received, so information cannot be verified

GLSN - Method Problems

- Diluted available phosphorus samples 11 times
- Diluted total phosphorus samples 26 times
- The volumes of each digested biogenic silica samples were measured before cooling. A volume correction factor of 15% was used for each result

NASN - Method Problems

- PI discovered an interference with the carbon analysis. Samples were re-analyzed. The reporting of new results was extremely disorganized.
- Many QC sample failures

Tributaries - Who & What

Focus	Investigator	Analytes
LHTN	WSLH	akalinity, Cl-, conductivity, NH3, NO2+NO3, P-tot, P-ortho, silica, SO4, TKN, total solids, volatile solids
WWTN	UW Chemistry Program	DOC, POC
USTN	USGS	PH, temperature, O2-dissolved, conductivity

Tributary Field Sampling

- Significant problems linking field and laboratory samples. Due to two different groups performing the sampling. Problems with coordination between groups.
- Field information collected by only one group is applied to all tributary samples. Does not always reflect actual sampling dates and times for WWTN and WWTM

LHTN Verification

- Laboratory had difficulties with data organization/tracking. First and second revisions, 1/3 of the data was missing
- QC limits changed frequently for most analytes, sometimes each day. Resulted in analysts not aware of QC failures when they occurred, no corrective actions taken by the laboratory

LHTN - Issues

- 51 INV flags applied to NH3 results across eight batches due to significant calibration check failures
- Total Phosphorus - 81 RFS results below the blank limit of 31 ppb
- No field QC samples were analyzed, except for duplicates

USTN - Issues

- No QC samples analyzed except for field duplicates

WWTN - Issues

- The actual field data for this focus was not reported with the laboratory data. The field data for USTN, LHTN, and LHTP was used

WWTN - More Issues

- The POC and DOC values were composites of 2 samples taken at two depths in the middle of the tributary.
- The TSS values, to be used for loading calculations, were composites of 6 samples taken at two depths at three sites across the tributary.
- The POC results were corrected so they could used for the loading calculations. Should the DOC results be corrected also?

Atmospheric - Who & What

Focus	**Investigator**	**Analytes**
GRAN	Grace Analytical Laboratory	pH, pHFLD, TKN, Cl-, NO2+NO3, Cond, TOC

GRAN - Verification

- Many typos in the results and sample IDs discovered in the reported data. To correct the problem a 100% check was done between the reported and raw data